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## SEQUENCE LISTING

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<110> University of Utah Research Foundation
     Cognetix, Inc.
      Olivera, Baldomero M
      McIntosh, J. Michael
      Garrett, James E.
      Walker, Craig S.
      Watkins, Maren
      Jones, Robert M.
      Linear Gamma-Carboxyglutamate Rich Conotoxins
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      2001-03-07
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Xaa
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       aa at residue 17 is Pro or hydroxy-Pro
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Xaa Ala
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       at residue 17 is Pro or hydroxy-Pro
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       Xaa at residue 2 is Pro or hydroxy-Pro; Xaa at residues 3, 7, 10,
        14, 16 and 17 is Glu or gamma-carboxy-Glu; Xaa at residue 5 is T
       yr, mono-halo-Tyr, di-halo-Tyr, 125I-Tyr, O-sulpho-Tyr, O-phospho
       -Tyr or nitro-Tyr
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Asn Xaa Xaa Thr Xaa Ile Xaa Ile Val Xaa Ile Ser Arg Xaa Leu Xaa
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Xaa Ile
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<223>
       12, 16, 18 and 19 is Glu or gamma-carboxy-Glu; Xaa at residue 5 i
       s Tyr, mono-halo-Tyr, di-halo-Tyr, 125I-Tyr, O-sulpho-Tyr, O-phos
       pho-Tyr or nitro-Tyr
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Asn Xaa Xaa Thr Xaa Xaa Asn Leu Xaa Leu Val Xaa Ile Ser Arg Xaa
                                     10
Leu Xaa Xaa Ile
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       u
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Ser Asp Xaa Xaa Leu Leu Arg Xaa Asp Val Xaa Thr Val Leu Xaa Leu
                                     10
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Xaa Arg Asn
                                  <210>
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                                                                             (1)..(19)
                                  <223>
                                                                           Xaa at residues 3, 4, 8, 11, 15 and 17 is Glu or gamma-carboxy-Gl
                                                                            u
                                 <400>
                                                                           10
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                                                                                                                                    5
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                                 Xaa Arg Asp
121
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Hand.
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                                                                           Xaa at residues 3, 4, 8, 11, 15 and 17 is Glu or gamma-carboxy-Gl
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                                 <210> 12
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                                 <223> Xaa at residues 2, 3, 7, 10 and 14 is Glu or gamma-carboxy-Glu
                                 <400> 12
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                                 1.
                                                                                                                                                                                                                                                             10
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                                 Ser
                                 <210> 13
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<222>
           (1)..(17)
           Xaa at residues 2, 3, 7, 10 and 14 is Glu or gamma-carboxy-Glu
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    <400> 13
    Ile Xaa Xaa Gly Leu Ile Xaa Asp Leu Xaa Ala Ala Arg Xaa Arg Asp
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                                                              15
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    Ser
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           Conus catus
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           PEPTIDE
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           (1)..(29)
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           at residues 3. 9, 25 and 28 is Pro or hydroxy-Pro; Xaa at residue
26 is Trp (D or L) or halo-Trp (D or L)
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           (1)..(29)
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           Xaa at residue 29 is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys
5
            or N, N, N-trimethyl-Lys
The same last and
    <400> 14
    Gly Xaa Xaa Xaa Val Gly Ser Ile Xaa Xaa Ala Val Arg Gln Gln Xaa
    1
                                         10
                                                              15
Cys Ile Arg Asn Asn Asn Asn Arg Xaa Xaa Cys Xaa Xaa
                 20
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    <213> Conus distans
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                                         10
                                                              15
    Met
    <210> 16
    <211> 19
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    <213> Conus distans
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    <221> PEPTIDE
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           (1)..(19)
    <223> Xaa at residue 1 is Gln or pyro-Glu; Xaa at residues 2, 7, 8, 10
            and 14 is Glu or gamma-carboxy-Glu; Xaa at residues 4 and 6 is Pr
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o or hydroxy-Pro

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Lys Ser Met
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       PRT
<213>
       Conus episcopatus
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       residue 14 is Lys, nor-Lys, N-methyl-Lys, N, N-dimethyl-Lys or N, N
       ,N-trimethyl-Lys
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       17
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1
                5
                                     10
                                                         15
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       Conus figulinus
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       (1)..(19)
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Gly Xaa Xaa Xaa Val Ala Xaa Met Ala Ala Xaa Ile Ala Arg Xaa Asn
                5
1
                                     10
                                                         15
Gln Ala Asn
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       sulpho-Tyr, O-phospho-Tyr or nitro-Tyr Xaa at residues 3, 7, 10,
       14 and 17 is Glu or gamma-carboxy-Glu
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<223>
        or N, N, N-trimethyl-Lys
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Ser Xaa Xaa Gln Ala Arg Xaa Val Gln Xaa Ala Val Asn Xaa Leu Xaa
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1

Xaa Arg

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<213> Conus figulinus

(1)..(19)

<220>

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            Xaa at residue 2 is Tyr, mono-halo-Tyr, di-halo-Tyr, 125I-Tyr, O-
            sulpho-Tyr, O-phospho-Tyr or nitro-Tyr Xaa at residues 3, 7, 10,
            14 and 17 is Glu or gamma-carboxy-Glu; Xaa at residue 28 is Pro o
            r hydroxy-Pro
<220>
<221>
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            (1)..(34)
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<223>
            dimethyl-Lys or N, N, N-trimethyl-Lys
<400>
            20
Ser Xaa Xaa Gln Ala Arg Xaa Val Gln Xaa Ala Val Asn Xaa Leu Xaa
Ŧ
     1
                      5
                                          10
                                                              15
Xaa Arg Gly Xaa Xaa Ile Ile Met Leu Gly Val Xaa Arg Asp Thr Arg
20
                                      25
                                                          30
     Gln Phe
     <210>
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            17
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            PRT
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            Conus figulinus
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     <221> PEPTIDE
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            (1)..(17)
     <223> Xaa at residue 2 is Tyr, mono-halo-Tyr, di-halo-Tyr, 125I-Tyr, O-
            sulpho-Tyr, O-phospho-Tyr or nitro-Tyr; Xaa at residues 3, 7, 10,
             14, 16 and 17 is Glu or gamma-carboxy-Glu
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                                                              15
                                          10
     Ile
     <210> 22
     <211> 19
     <212>
            PRT
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Xaa at residues 5, 6, 9, 12 and 16 is Glu or gamma-carboxy-Glu

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Leu Ser Leu
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       23
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       PRT
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       Conus lynceus
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Ala Ala Asn
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       or N,N,N-trimethyl-Lys; Xaa at residues 3, 4, 7, 10, 14, 16 and 1
       7 is Glu or gamma-carboxy-Glu
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Xaa Ile
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                                Xaa at residues 2, 3, 4, 7, 11, 15 and 16 is Glu or gamma-carboxy
                                 -Glu; Xaa at residue 19 is Lys, nor-Lys, N-methyl-Lys, N,N-dimeth
                                 yl-Lys or N, N, N-trimethyl-Lys
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Xaa at residues 2, 3, 4, 10, 14 and 23 is Glu or gamma-carboxy-Gl
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                                 u; Xaa at residues 7 and 19 is Lys, nor-Lys, N-methyl-Lys, N,N-di
Œ
The track that the tr
                                methyl-Lys or N, N, N-trimethyl-Lys
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                                 (1)..(24)
                                Xaa at residue 8 is Tyr, mono-halo-Tyr, di-halo-Tyr, 125I-Tyr, O-
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                                 u; Xaa at residues 7 is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-
                                Lys or N, N, N-trimethyl-Lys
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                                 sulpho-Tyr, O-phospho-Tyr or nitro-Tyr
              <400> 28
              Gly Xaa Xaa His Ser Xaa Xaa Gln Xaa Cys Leu Arg Xaa Val Arg
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Val Asn Asn Val Gln Gln Xaa Cys
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      Xaa at residues 2, 3, 4, 10, 14 and 23 is Glu or gamma-carboxy-Gl
       u; Xaa at residues 7 and 19 is Lys, nor-Lys, N-methyl-Lys, N,N-di
       methyl-Lys or N, N, N-trimethyl-Lys
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      Xaa at residue 8 is Tyr, mono-halo-Tyr, di-halo-Tyr, 125I-Tyr, O-
<223>
       sulpho-Tyr, O-phospho-Tyr or nitro-Tyr
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Val Asn Xaa Val Gln Gln Xaa Cys
            20
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       Xaa at residues 19 is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-Ly
       s or N,N,N-trimethyl-Lys
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       sulpho-Tyr, O-phospho-Tyr or nitro-Tyr
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       Xaa at residues 3, 4, 7, 10, 13 and 14 is Glu or gamma-carboxy-Gl
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1
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       at residue 11 is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys or
       N, N, N-trimethyl-Lys
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       32
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1
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       at residue 20 is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys or
       N, N, N-trimethyl-Lys
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                                                         15
Glu Leu Gln Xaa
            20
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Glu Ard	g Arg 35	Ser	Gly	Asp	Ala	Thr 40	Ala	Leu	Arg	Pro	Glu 45	Pro	Val	Leu	
Leu Gla	n Lys	Ser	Ala	Ala	Arg 55	Ser	Thr	Asp	Asp	Ser 60	Gly	Lys	Asp	Arg	
Leu Th	r Gln	Met	Lys	Arg 70	Ile	Leu	Lys	Lys	Gln 75	Gly	Asn	Thr	Ala	Lys 80	
Ser As	p Glu	Glu	Leu 85	Leu	Arg	Glu	Asp	Val 90	Glu	Thr	Val	Leu	Glu 95	Leu	
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Glu Arg Arg Ser Gly Asp Ala Thr Ala Leu Arg Pro Glu Pro Val Leu
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Leu Thr Gln Met Lys Arg Ile Leu Lys Lys Gln Gly Asn Thr Ala Lys
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                                 25
Glu Arg Arg Ser Gly Asp Ala Thr Ala Leu Arg Pro Glu Pro Val Leu
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Leu Thr Gln Met Lys Arg Ile Leu Lys Lys Gln Gly Asn Thr Ala Lys
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Glu Arg Asn Gly Lys Arg

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                                25
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Glu Arg Arg Leu Ala Asp Ala Thr Ala Leu Glu Ala Glu Pro Val Leu
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Leu Gln Lys Ser Ala Ala Arg Ser Thr Asp Asn Asn Gly Lys Asp Arg

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<212>

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Ser Thr Gln Met Arg Arg Ile Leu Lys Lys Gln Gly Asn Thr Ala Arg
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                    70
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Ser Gly Lys Arg
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                                             60
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Leu Thr His Met Lys Arg Ile Leu Lys Lys Arg Ala Asn Lys Arg Glu
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                                                             80
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       at residues 3, 9, 25 and 28 is Pro or hydroxy-Pro; Xaa at residue
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       -phospho-Tyr or nitro-Tyr
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                                 25
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Glu Arg Arg Ser Ala Asp Ala Thr Ala Leu Lys Pro Glu Pro Val Leu
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                             40
                                                 45
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Leu Thr Gln Arg Lys Arg Ile Leu Lys Lys Arg Gly Asn Thr Ala Arg
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                                                             80
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       pho-Tyr or nitro-Tyr
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Leu Xaa Xaa Ile

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                                 25
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Glu Arg Arg Ser Ala Asp Ala Thr Ala Leu Lys Pro Glu Pro Val Leu 🕔
        35
                             40
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Leu Gln Lys Thr Ala Ala Arg Ser Thr Asp Asp Asn Gly Lys Lys Arg
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Leu Thr Gln Arg Lys Arg Ile Leu Lys Lys Arg Gly Asn Thr Ala Arg
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       phospho-Tyr or nitro-Tyr
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            20
                                25
                                                     30
Glu Arg Arg Leu Ala Asp Ala Thr Ala Leu Lys Pro Glu Pro Val Leu
        35
                             40
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Leu Gln Lys Ser Ala Ala Arg Ser Thr Asp Asp Asn Gly Lys Asp Arg
    50
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Leu Thr Gln Met Ile Arg Ile Leu Lys Lys Arg Gly Asn Met Arg Gly
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Xaa

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Glu Arg	Arg L 35	eu Ala	Asp	Ala	Thr 40	Ala	Leu	Lys	Pro	Glu 45	Pro	Val	Leu		
Leu Gln 50	Lys S	Ser Ala	Ala	Arg 55	Ser	Thr	Asp	Asp	Asn 60	Gly	Lys	Asp	Arg		
Leu Thr 65	Gln M	let Ile	Arg 70	Ile	Leu	Lys	Lys	Arg 75	Gly	Asn	Met	Arg	Gly 80		
Glu Glu	Val A	arg Glu 85	Ser	Ala	Glu	Thr	Leu 90	His	Glu	Ile	Thr	Pro 95			
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agagacggcg aagaagtcag agaggctgca gagactctta atgaactcac gccgtaggaa	300
aaagaaaaag attaatcaag ctgggtgttc cacgtgacac tcgtcagttc taaagtaccc	360
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Leu Gln Lys Ser Ala Ala Arg Ser Thr Asp Asp Asn Gly Lys Asp Arg 50 55 60	
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Pro	
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Leu Gl	.n Lys Ser i	Ala Ala Aro	g Ser Th	r Asp Asp	Asn Gly 60	Lys Asp	Arg	
Leu Th 65	nr Gln Met 1	Ile Arg Ile 70	e Leu Ly	s Lys Arg 75	Gly Asn	Met Arg	Gly 80	
Gly G	u Val Arg	Glu Ser Ala	a Glu Th	r Leu His	Glu Ile	Thr Pro		

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caacga	caag ga	caggat	ga ctcaç	aggaa	gaç	ggatt	ctc	aaaa	agto	gat	gaaad	cacggo	240
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Glu Ar	g Arg L 35	eu Ala	His Ala	Arg 40	Val	Ile	Glu	Pro	Asp 45	Pro	Ala	Pro	
Leu Glu 50	ı Asn S	er Ala	Leu Arg	Ser	Ile	Arg	Arg	Gln 60	Arg	Gln	Gly	Gln	

Asp Asp Ser Glu Glu Glu Asp Ser Gln Lys Val Met Lys His Gly Gln

The Health of the Brain and the Brain of the Brain of the great the Brain of the Br

Arg Arg Glu Arg Arg 

<210> 77 <211> 24 <212> PRT <213> Conus ammiralis	
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70

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At 18

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Leu Ile Gln Met Lys Arg Ile Leu Lys Lys Arg Gly Asn Lys Arg Glu 65 70 75 80										
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agaggcgagg aagaagttgc agagatggcg gcagagattg caagagaaaa tcaagcaaac 30	Ο									
gggaaaagat aatcaaactg ggtgttccac gtgacactcg tcagttctaa agtccccaga 36	0									
taggtcgttc tctatgtttg ccacattctt tctttttctt ttcatttaat tccccaaatc 42	0									
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Conus figulinus

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                                                 45
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Gln Phe
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20

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aaaaagataa tcatgctggg tgttccacgt gacactcgtc agttctaaag cccccagata
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                                 25
                                                     30
Glu Arg Arg Leu Ala Asp Thr Thr Ala Leu Lys Pro Glu His Val Leu
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                             40
                                                 45
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                        55
                                             60
Leu Thr Gln Met Lys Arg Ile Leu Lys Lys Gln Gly Asn Thr Ala Arg
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                                         75
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Ser Tyr Glu Gln Ala Arg Glu Val Gln Glu Ala Val Asn Glu Leu Lys
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        14 and 17 is Glu or gamma-carboxy-Glu; Xaa at residue 28 is Pro
       or hydroxy-Pro
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Gln Phe

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Conus figulinus

PEPTIDE

<213>

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Glu Gl	y Arg 35	Ser	Ala	Asp	Ala	Thr 40	Ala	Pro	Lys	Pro	Glu 45	Pro	Val	Leu	
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                                         75
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Glu Glu Val Glu Arg His Thr Glu Arg Leu Lys Ser Met Gly Lys Arg
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90

95

85

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Leu Thr Gln Met Lys Arg Ile Leu Lys Lys Arg Gly Asn Lys Arg Glu

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